

WHAT IS CLAIMED IS:

1. A gravitational wave generating device comprising:

5 a plurality of target nuclei aligned in a constrained state,

a source of submicroscopic particles directed at the target nuclei,

10 connected to the particle source for selectively propelling the particles toward the target nuclei to produce a nuclear reaction, and

a containment system for aligning the products of the nuclear reaction such that the particles move in approximately the same direction, produce a jerk or oscillation in the motion of the target nuclei and thereby generate gravitational waves,

20 2. A device according to claim 1 in which the plurality of target nuclei are contained in a superconducting medium.

3. A device according to claim 1 in which the plurality of target nuclei comprises a gas.

25 4. A device according to claim 3 wherein the gas includes electron gas.

5. A device according to claim 1 in which the plurality of target nuclei comprises a fluid.

30 6. A device according to claim 5 in which the fluid is a superconducting fluid.

7. A device according to claim 1 in which the plurality of target nuclei are contained in an electromagnetic field.

8. A device according to claim 7 in which the electromagnetic field is external to the plurality of target nuclei.

9. A device according to claim 7 in which the electromagnetic field is ferromagnetic.

10 10. A device according to claim 7 in which the electromagnetic field is internal to the plurality of target nuclei.

11. A device according to claim 10 in which the electromagnetic field comprises intermolecular forces.

12. A device according to claim 1 in which the plurality of target nuclei are aligned in a spin-polarized state.

20 13. A device according to claim 1 in which the source of particles for producing nuclear-reaction products is a pulsed particle beam.

25 14. A device according to claim 13 in which the particles comprising the particle beam are photons.

15. A device for generating gravitational waves utilizing nuclear reactions to produce physical motion of submicroscopic particles.

30 16. A gravitational wave generating device comprising:
a plurality of target energizable elements,
a plurality of energizing elements that act on the energizable elements and generate gravitational waves, and

5 a computer controlled logic system operatively connected to the energizing elements to control the action of the energizing elements.

10 17. A device according to claim 16 in which the energizable elements are energized to produce a third time derivative of the motion of the energizable elements or a jerk.

15 18. A device according to claim 16 in which the energizable elements are energized to produce a harmonic oscillation.

20 19. A device according to claim 16 in which the energizable elements are molecules.

25 20. A device according to claim 16 in which the energizable elements are atoms.

30 21. A device according to claim 16 in which the energizable elements are atomic nuclei.

35 22. A device according to claim 16 in which the energizable elements are nuclear particles.

25 23. A device according to claim 16 in which the energizing elements are an anisotropic particle beam.

30 24. A device according to claim 16 in which the energizing elements are an isotropic particle beam.

35 25. A device according to claim 16 in which the energizing elements create a multiquantum vibrational event for the energizable elements on a subpicosecond time scale and generate gravitational waves.

26. A device according to claim 23 in which the beam
5 particles collide with the energizable elements and produce a
jerk or oscillation motion and generate gravitational waves.

27. A device according to claim 26 in which the beam
particles collide with the energizable elements to produce a
nuclear reaction.

10 28. A device according to claim 16 in which the energizing
elements are microwaves.

29. A device according to claim 16 in which the energizing
elements are one or more magnetic fields.

30. A device according to claim 16 in which the energizing
elements are one or more electric fields.

20 31. A device according to claim 16 in which the energizable
elements are aligned.

25 32. A device according to claim 16 in which the energizing
elements move in step to define a gravitational-wave front and
energize the energizable elements in sequential order to generate
and accumulate gravitational-wave energy as the gravitational-
wave front progresses.

30 33. A device according to claim 16 in which the energizing
elements are photons of a laser.

34. A device according to claim 16 in which the energizing
elements are electrons.

5 35. A device according to claim 16 in which the energizing elements are protons.

36. A device according to claim 16 in which the energizing elements are neutrons.

10 37. A device according to claim 16 in which the energizing elements are nuclear particles.

38. A device according to claim 16 in which the energizing elements are atomic nuclei.

5 39. A device according to claim 16 in which the energizing elements are molecules.

40. A device according to claim 39 in which the molecules are ionized.

20 41. A device according to claim 16, in which the energizing elements are current-carrying coils.

25 42. A device according to claim 16, in which the energizable elements are one or more permanent magnets.

43. A device according to claim 16, in which the energizable elements are one or more electromagnets.

30 44. A device according to claim 16, in which the energizing elements are current-carrying electrical conductors.

45. A device according to claim 16, in which the energizable elements are current-carrying electrical conductors.

5 46. A gravitational wave detection device in which collector elements are interrogated in sequence according to an expected gravitational wave frequency in order to be a tuned gravitational wave receiver.

10 47. A device according to claim 46 in which the interrogations continue as the gravitational wave phase is determined and locked on by a control computer.

48. A device according to claim 46 in which the collector elements are transducers.

49. A device according to claim 48 in which the transducers are parametric transducers.

50. A device according to claim 46 in which the collector elements are capacitors.

20 51. A device according to claim 46 in which the collector elements are harmonic oscillators.

25 52. A device according to claim 46 in which the collector element's signal can be measured by a superconducting quantum interference device (SQUID).

30 53. A device according to claim 46 in which the signal from the collector elements are sensed using quantum non-demolition (QND) techniques.

54. A device according to claim 32 in which the gravitational waves comprising the wave front are coherent.

55. A device according to claim 46 in which the collector elements are interrogated in a pattern according to an expected 5 incoming gravitational wave direction in order to achieve directivity in GW reception.

56. A device according to claim 16 in which the energizable elements are energized in a pattern in order to achieve 10 directivity in gravitational wave transmission.

57. A device according to claim 46 in which the directivity is changed over time in order to scan for gravitational wave transmissions.

58. A device according to claim 56 in which the directivity is changed over time in order to control the direction of the gravitational wave transmissions.

59. A device according to claim 56 in which the energizing elements are energized in a pattern that will transmit gravitational waves to a radiating gravitational wave transmitter in order to establish a GW communications source.

25 60. A device according to claim 16 in which the energizable elements are harmonic oscillators.

61. A device according to claim 46 in which the collector elements are an array of passive element sets or subsets.

30 62. A device according to claim 61 in which the collector element sets or subsets are disposed in a spherical array.

63. A device according to claim 62 in which the spherical 35 array of collector element sets or subsets comprises a plurality

of piezoelectric crystals spread evenly over the surface of a sphere.

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64. A device according to claim 16 in which the energizable elements are capacitors.

10 65. A device according to claim 16 in which the energizable

elements are an array of passive element sets or subsets.

66. A device according to claim 65 in which the energizable element sets or subsets are disposed in a spherical array.

15 67. A device according to claim 66 in which the spherical array comprises piezoelectric crystals spread evenly over the surface of a sphere.

20 68. A device according to claim 66 in which the energizable element sets or subsets comprise spherical piezoelectric

crystals.

25 69. A device according to claim 68 in which electrodes are

spread evenly over the surface of the piezoelectric crystals and operatively connected to a power source.

30 70. A device according to claim 62 in which the collector

element sets or subsets comprise spherical piezoelectric crystals.

71. A device according to claim 70 in which electrodes are spread evenly over the surface of the piezoelectric crystals and operatively connected to a computer.

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72. A device according to claim 42 in which the permanent magnets are submicroscopic.

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73. A device according to claim 43 in which the electromagnets are submicroscopic.

10 74. A device according to claim 46 in which the collector elements are submicroscopic.

75. A device according to claim 46 in which the tuned gravitational wave receiver receives gravitational waves refracted by a medium positioned in front of the gravitational-wave receiver.

76. A device according to claim 75 in which the medium is a superconducting medium.

20 77. A device according to claim 75 including a lens for concentrating or focusing the gravitational waves.

78. A device according to claim 75 including a series of gravitational-wave refracting media for concentrating or focusing the gravitational waves.

25 79. A device according to claim 16 in which a refractive medium concentrates or focuses the gravitational waves emitted by the gravitational wave generator.

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80. A device according to claim 46 in which the gravitational wave frequency is generated by an extra terrestrial, astrophysical event.

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81. A device according to claim 56 in which the pattern produces constructive interference among some of the gravitational waves.

82. A device according to claim 56 in which the pattern produces destructive interference among some of the gravitational waves.

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83. A device according to claim 16, in which the energizable elements are piezoelectric crystals.

84. A device according to claim 16, in which the energizable elements are nanomachines.

85. A device according to claim 84 in which the nanomachines are harmonic oscillators.

86. A device according to claim 84 in which the nanomachines are nanomotors.

87. A device according to claim 84 in which the nanomachines are solenoids.

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88. A device according to claim 84 in which the nanomachines are microelectromechanical systems (MEMS).

89. A gravitational wave communications device comprising:
30 a plurality of target nuclei aligned in a constrained state,

a source of submicroscopic particles directed at the target nuclei,

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5 a computer-controlled logic system operatively connected to the particle source for selectively propelling the particles toward the target nuclei to produce a nuclear reaction,

10 10 a containment system for aligning the products of the nuclear reaction such that the particles move in approximately the same direction, produce a jerk or oscillation in the motion of the target nuclei and thereby generate gravitational waves, and

15 a transmitter operatively connected to the containment system for modulating the gravitational waves.

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5 a gravitational wave generator for producing gravity waves,

10 a modulator connected to the generator for imparting information to the gravity waves,

15 a detector for receiving the modulated gravity waves, and

20 a demodulator for extracting the information from the gravitational waves and delivering it to a presentation device.

97. A device according to claim 16 in which the energizing elements are antiprotons.

98. A device according to claim 16 in which the energizable elements are antiprotons.

99. A gravitational wave propulsion system comprising:

20 a gravitational wave generator for producing coherent gravitational waves,

25 a housing for the gravitational wave generator for channeling and directing the gravitational waves in a direction opposed to the direction of propulsion, and

30 refractive control elements for altering the direction of the gravitational waves.

100. A gravitational wave propulsion system comprising:

35 a gravitational wave generator for producing coherent gravitational waves,

a housing for the gravitational wave generator for channeling and directing the gravitational waves in a direction opposed to the direction of propulsion, and

refractive control medial for focusing the gravitational waves.

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101. A gravitational wave focusing system comprising:

5 a source of gravitational waves,

a first medium for transmitting said gravitational waves, and

10 a second medium interposed in the direction of travel of the gravitational waves for reducing the speed of transmission therein.

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102. A device according to 101 in which the second medium is a superconductor.

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